Name: Date:

Polynomial Factoring solution (version 17)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 10x + 27 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(1)(27)}}{2(1)}$$

$$x = \frac{-(10) \pm \sqrt{100 - 108}}{2(1)}$$

$$x = \frac{-10 \pm \sqrt{-8}}{2}$$

$$x = \frac{-10 \pm \sqrt{-4 \cdot 2}}{2}$$

$$x = \frac{-10 \pm 2\sqrt{2}\, i}{2}$$

$$x = -5 \pm \sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $7 - 5i$ and $-6 + 3i$ in standard form $(a + bi)$.**

Solution

$$(7 - 5i) \cdot (-6 + 3i)$$

$$-42 + 21i + 30i - 15i^2$$

$$-42 + 21i + 30i + 15$$

$$-42 + 15 + 21i + 30i$$

$$-27 + 51i$$

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3. **Write function $f(x) = x^3 + 3x^2 - 22x - 24$ in factored form. I'll give you a hint: one factor is $(x + 6)$.**

Solution

	1	3	-22	-24
-6		-6	18	24
	1	-3	-4	0

$$f(x) = (x+6)(x^2 - 3x - 4)$$

$$f(x) = (x+6)(x-4)(x+1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+1)^2 \cdot (x-2) \cdot (x-5) \cdot (x-8)^2$$

Sketch a graph of polynomial $y = p(x)$.